
U.S. Army Materiel Command
General Paul Kern
Tactical Wheeled Vehicle Conference
28 January 2002

The Army Materiel Command Vision

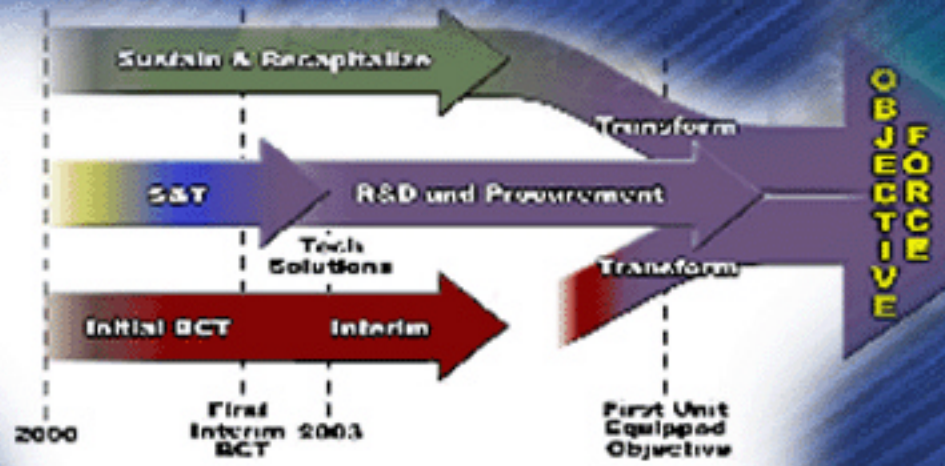
Essential in Peace, Indispensable in War

Dedicated and innovative people paving the way in Army Transformation. We will provide the integrated, cutting edge technology and sustainment needed to create a more responsive, agile, strategically deployable and sustainable Army. While unfailingly meeting our worldwide commitments today, our efforts will help posture the nation to meet the broader demands of the newly emerging missions of the 21st Century.

TRANSFORMATION

Reduce Fuel, Spare Parts and Munitions Requirements

Reduce the number and types of trucks



Reduce the Footprint

Reduce the number of support personnel mechanics

. . . Responsive, Deployable, Agile, Versatile, Lethal, Survivable, Sustainable.

21st Century Truck Partnership

Developing Technologies for 21st Century Trucks

Military and Industry Convergence

Department of Defense

Department of Energy

Department of Transportation

EPA
Environmental Protection Agency

Council on Environmental Quality
Office of Management & Budget
Office of Science & Technology Policy

Academia

Cummins

Mack

VOLVO

OSHKOSH

EATON

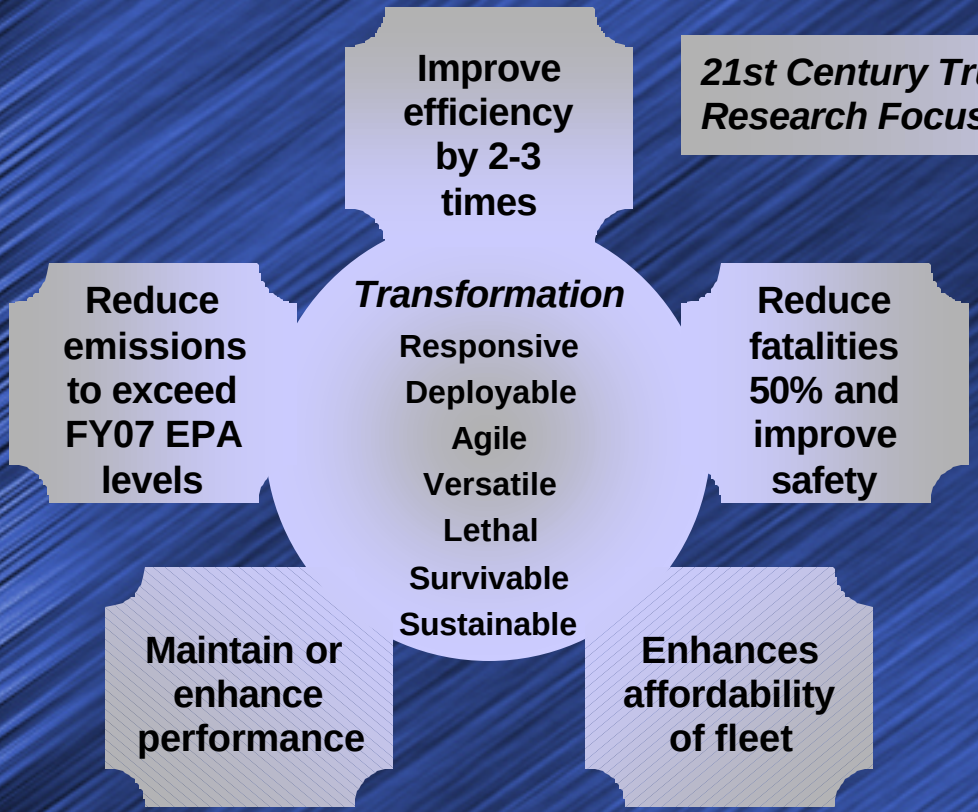
PACCAR Inc

CATERPILLAR

DETROIT DIESEL CORPORATION

LOCKHEED MARTIN

21st Century Truck Partnership Goals Satisfy the Army's Needs



21st Century Truck Initiative Research Focus

50-67% fuel savings

Decrease the force logistics structure

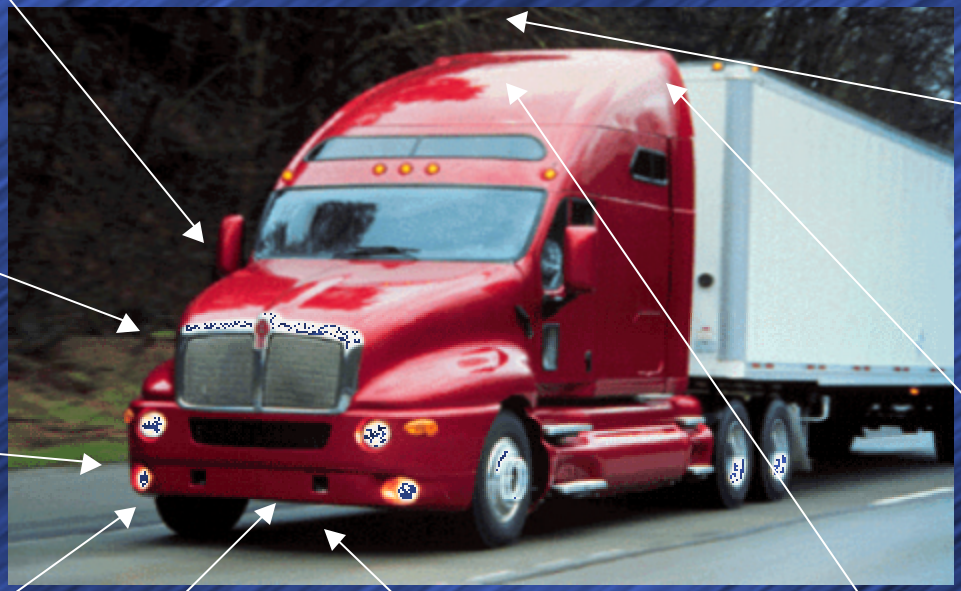
Increase survivability on battle field

Reduce numbers of special purpose equipment and mechanics

Decrease deployment closure times

Increase efficiency and availability of equipment and manpower

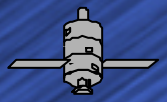
…Technology Transfer to the Future Force



- Fuel Cells
- Hybrid electric
- Next Generation Electrical Architecture
- Continuously Variable Transmission
- Telematics
- Cleaner Fuels
- Diagnostics & Prognostics
- High Strength Materials
- Advanced Communications

Vehicle Intelligence

- Advanced communications
- Early warning technologies
- Vehicle diagnostics and prognostics
- Telematics

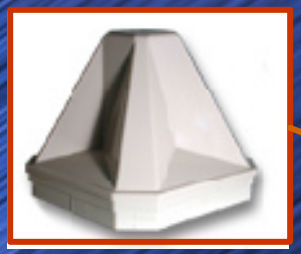


Satellite

CLS Facility
Sealy, Texas

Division MMC

TACOM PM-FMTV



Satellite Module

J1939 Open System Architecture

Truck-PC

- On-board Diagnostics
- GPS-Map Generation
- Voice Actuation
- AIT Capable
- Supply Chain Management

Fuel

- What is the cost of a gallon of fuel?
  - Cost with Delivery (1 - 400 US Dollars)
- What are our on-board power requirements?
  - Increasing power elements
    - Radio/Lights
    - Night Vision
    - MTS
    - FBCB2
    - ???

FUEL CELLS AND APPLICATIONS

Liquid Fueled

Solid Oxide

Regenerative

Currently fuel cells nearly ready for heavy truck auxiliary power

Future fuel cells needed for propulsion systems

Hybrid Electric Projects

HMMWV

COMBATT

- Improved fuel efficiency
- On-board and off-board power

M-113

Class 8

HEMTT LHS

Logistical Capabilities or Logistical Burden

42 - Volt Initiatives

- MIT 42v Consortium
  -- NAC funding MIT Consortium
  -- Includes “Big Three” and Many Two Tier Suppliers

- Society of Automotive Engineers 42v Working Group
  -- Initiated by TARDEC
  -- Focus on Common Standards

We need to partner with industry on our power requirements

Reliability -- Availability -- Maintainability -- Dependability

New Way of Thinking

- Lifetime Fuel Oil Filter
- Extended Oil Drain Intervals
- Intelligent Batteries
  - -- Reduced Battery Failure
  - -- Improved Fuel Efficiency
  - -- Reduction in Maintenance/Logistics Support
- Fuel Filter Rating System Being Proposed as International Standard
- Fuel Water Separators, Fuel Injectors, Oil Pumps, Water Pumps, Tracks, Roadwheels
- Leverage Commercial Sector Developments

Incremental Change

Max Time Time to Repair vs Mean Time Between Failures

The Ohio Airship Story

- Intricate Design (Faster than a Ship/Slower than a Jet)
- Encountered Problems: (Excessive Delivery Loads to Infrastructure)
- Expanded Their Thinking
- More “Holistic Approach”
- Develop a Solution that Considers the Whole System
  - Intermodal
  - Producer to Consumer

Future Tactical Truck System

Hybrid Electric Vehicle

Load Handling System

Robotics

Digitization

Human factors

Situational awareness

Commercial technology advances

Active suspension

Powered trailers

Survivability

Final Thoughts

- **Everything we do here has to help with the transformation effort.**
- **Cannot continue with an incremental approach.**
- **Leveraging what is going on with engineering, RDE and the commercial sector.**


Facing the Future...
AMERICA'S
ARSENAL FOR THE BRAVE
Together
1916-23

Back-ups

SmarTruck Current Capabilities

- Bullet Proof Glass
- On-Board Diagnostics
- ARMORMAX®
- Wireless Communication
- Non-Lethal Weaponry
- Night Vision
- B.F. Goodrich Run Flat Tires
- Touch Screen Display
- Bomb Detection
- Global Positioning System

Committed to Excellence

(As of 21 May 2001)

Hybrid Electric Vehicles

LAV

- Electrolyze H2 into Canisters (using diesel-powered vehicular DC grid)
- Energize Silent Watch by Fuel Cell (consuming deferred hydrogen)

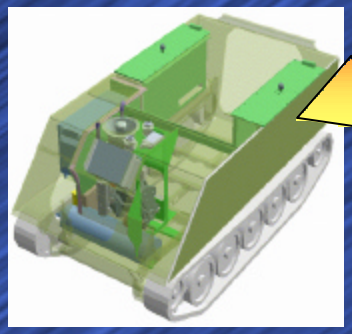
Commercial Bus

- Partnership with Georgetown University, TACOM, and DOT
  - Total value $11M ($5M TACOM + $6M DOT)
  - Will develop and demonstrate a methanol reformer fueled, PEM fuel cell bus, powered by two NECAR 6 engines
  - Non-hybrid electric drive; fuel cell engines will give real-time throttle response to 30-ft bus

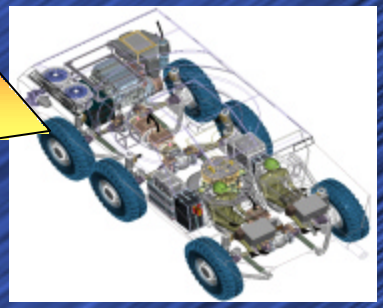
"An incremental learning step towards full scale electrification of combat platforms"

Hybrid Electric Programs

RST-V

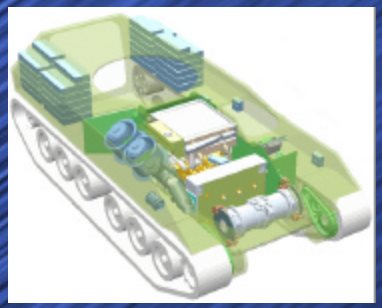


FSCS



Military

M113

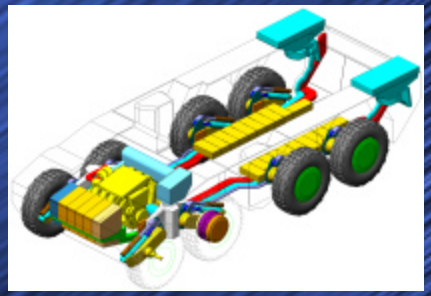


CHPS

BFV

HMMWV

Advanced Hybrid Electric Wheel Drive



Dual Use

Class 8

HEMTT

COMBATT

FMTV

ESSENTIAL IN PEACE, INDISPENSABLE IN WAR